

**EXECUTIVE SUMMARY**

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# EXECUTIVE SUMMARY

## 1.0 INTRODUCTION

The Bureau of Land Management is analyzing a coalbed and conventional natural gas development proposal received from Anadarko E & P Company, LP, as lead proponent for a group of companies including Warren Resources, Inc., and Double Eagle Petroleum and Mining Company (Companies). The Atlantic Rim project EIS was originally scoped in 2001 as the “Atlantic Rim Coalbed Methane Project”. Subsequently, the project was re-named the “Atlantic Rim Natural Gas Development Project” in view of the proponents’ request to reduce the number of wells proposed and to develop a limited number of conventional gas wells. The Atlantic Rim project area (ARPA) includes about 270,035 acres with surface ownership of approximately 173,672 acres Federal, 14,060 acres State of Wyoming, and 82,348 acres of privately held surface. Currently within the ARPA are 116 natural gas wells completed to coal formations under an exploratory interim drilling program (IDP). Wells, roads, pipelines, compressors and other facilities have also been constructed in conjunction with the IDP.

The proposed action would develop the natural gas resource by drilling up to 2,000 wells, 1,800 to coal beds and 200 to other formations, for a spacing of up to 80 acres per well. In addition, supporting development including pipelines, roads, and ancillary facilities are proposed. Produced water from coalbed natural gas wells is proposed for sub-surface re-injection. Any electrical powerlines would be buried under this proposal.

Comments received to this draft environmental impact statement will be reviewed, evaluated, and responded to within the EIS process. Revisions, changes, and corrections arising from comments to the draft EIS will be assembled and released in a subsequent Atlantic Rim final EIS, also for public review and comment. Subsequently a Record of Decision detailing the Bureau of Land Management’s decision and the rationale behind it will be released to the public.

### 1.0.1 Purpose and Need

The purpose for the Companies’ proposal is to drill for, remove and sell natural gas resources. As America’s need for energy continues, natural gas has emerged as an important industrial and domestic fuel source. Development of domestic natural gas reserves reduces the country’s dependence on foreign sources of energy and maintains a supply of fuel for domestic consumption, industrial production, power generation and national security.

### 1.0.2 Issues and Concerns

The scoping process helped the BLM focus on key issues and concerns:

- Issue 1. Increased traffic and the potential for associated impacts on existing county, state, and BLM roads.
- Issue 2. Adverse socio-economic impacts to local communities.
- Issue 3. Impacts to surface water quality and resources, including an increased rate of delivery of sedimentation and salts to the Colorado River system.
  - Issue 3a. Impacts to surface hydrology including higher overland flow in response to increased road density.

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- Issue 4. Impacts to groundwater resources, including sedimentation/excess salts to the Colorado River system.
- Issue 5. Potential impacts to sensitive soils within the project area.
- Issue 6. Impacts to air quality from drill rig emissions and production activities.
- Issue 7. The ability to successfully reclaim disturbed areas, timely reclamation of disturbed areas and control of noxious weed invasions.
- Issue 8. Potential conflicts with livestock management operations in the project area, including possible impacts to range improvement projects.
- Issue 9. Potential impacts to cultural and historic values within the project area including historic trails, sites eligible for inclusion in the National Register of Historic Places, and other cultural resources.
- Issue 10. Potential impacts to wildlife habitats within the project area, including those supporting big game, greater sage-grouse, and raptors.
- Issue 11. Potential impacts to listed, or proposed for listing, threatened and endangered plant and animal species, including potential Colorado River depletions and effects on downstream listed threatened and endangered fish species.
- Issue 12. Potential impacts to sensitive plant and wildlife species such as the bluehead sucker, the roundtail chub, the flannelmouth sucker, and the Colorado cutthroat trout.
- Issue 13. Cumulative effects of drilling and development activities when combined with other ongoing and proposed developments on lands adjacent to the Atlantic Rim project area.
- Issue 14. Potential conflicts between mineral development activities and recreational opportunities.

### 1.1 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The draft EIS considers four alternatives in detail. They are the proposed action, Alternative A - No Action; Alternative B, and Alternative C. In addition, numerous other alternatives were considered but not analyzed in detail as disclosed in Chapter 2.

#### 1.1.1 The Proposed Action

The proposed action consists of drilling and developing approximately 2,000 new natural gas wells. Approximately 1,800 would be drilled to Mesaverde formations coals to develop coalbed natural gas (CBNG) resources. An additional 200 wells would be drilled to access conventional natural gas found in other formations, generally expected to be deeper. The 2,000 proposed, new natural gas wells would be in addition to the approximately 116 ARPA exploration wells already drilled from the interim drilling period.

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Proposed well spacing is 8 wells per section (80 acre spacing) throughout the project area but may reduce to 4 wells per sections (160 acre spacing) depending on the geology and ability of the operators to release the water and pressure sufficiently recover the gas. Development and drilling would begin in 2006 within the ARPA and continue for approximately 20 years, with a life-of-project (LOP) of 30-50 years. Various drilling and production related facilities (e.g., roads, pipelines, water wells, disposal wells, compressor stations, and gas processing facilities) would also be constructed throughout the ARPA.

### **1.1.2 Alternative A – No Action**

NEPA regulations require that EIS alternative analyses in the EIS “include the alternative of no action” (40 CFR 1502.14(d)). For this analysis, “no action” means that the BLM would reject the Proponents’ proposal and “the proposed activity would not take place.”

### **1.1.3 Alternative B**

This alternative proposes the same number and spacing of wells as in the proposed action. The entire project area would be developed over the course of 20 years, however, the drilling and development would occur in three phases. The first phase to be developed over a 6 – 7 year period would be within the vicinity of the Doty Mountain, Sundog/Cow Creek, and Blue Sky PODs.

During the first phase of development approximately 925 well locations would be developed. Once completed and in production, the second phase of development is proposed to occur in the northern one-third of the project area, near and including the Jolly Roger and Red Rim PODs. The third and final phase of development would occur near and including Brown Cow and Muddy Mountain PODs. Construction and drilling would last from 6-7 years per zone and would include completion of interim reclamation. Gas production operations would begin and continue within an active zone as construction occurs. The extent of gas production facilities would continue to accumulate as time passes with ultimately the same level of operational (production) disturbance as the other action alternatives at completion. Once developed, production would continue throughout the project area.

### **1.1.4 Alternative C**

Development for natural gas would occur as in the proposed action, but would be conditioned with the application of required development protection measures (DPM) in those areas with sensitive or crucial resource values (Appendix L) resulting in fewer acres of disturbance and reduced road density. Generally, DPMs focus on surface disturbance limits, modification of drilling and construction practices, and, in some cases, no surface occupancy. Examples of such areas are sensitive wildlife and fish habitat, and areas with sensitive soils. These types of areas are unique enough to require additional protective measures beyond what is already provided by applying Required Best Management Practices (BMPs) (Appendices H and J), lease stipulations, and Conditions of Approval (COAs) (Appendix K). As an end product, geographic information system (GIS) layers would be available to operators for development of site specific proposals for their planning of the annual program of work during the Application for Permit to Drill (APD) process.

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### 1.2 ENVIRONMENTAL ANALYSIS

#### 1.2.1 Geology / Minerals / Paleontology

No significant effects are anticipated for these resources under any of the action alternatives (proposed action, alternative B and alternative C). The purpose of this proposal is to remove natural gas resources which would be permanently removed.

#### 1.2.2 Soils

For the proposed action and Alternative B many areas are expected to exceed the significance criteria for soils. Some localized areas are expected to have effects that exceed the soils significance criteria under alternative C. The revegetation potential of disturbed soils is expected to be low to moderate under all the alternatives. While no biological crusts are mapped or known to exist with the ARPA, some crusts, if they do exist, may be damaged as a result of the proposed action and alternative B. Fewer crusts are expected to be damaged or removed under alternative C.

#### 1.2.3 Water Resources

Impacts to waterbodies with impairment or threats of impairment to the State of Wyoming's 303d list (Muddy Creek) are expected from the proposed action and alternative B. Impacts to Muddy Creek under alternative C would not likely be significant.

Salinity loading in run-off would increase above background conditions for the proposed action and alternative B. Under alternative C salt loads would be measurably higher but are not expected to be significant.

Under the proposed action and alternative B changes in hydrologic function in wetlands would occur, and indirect impacts could be significant. Direct impacts are expected to occur but not be significant. For alternative C, direct and indirect impacts are not likely to be significant. Changes in stream flow characteristics would occur under the Propose Action and indirect effects could be significant. For alternative B, changes in hydrologic function would occur but are expected to have lower impacts than under the proposed action. Indirect effects could be significant. Under alternative C impacts are not likely to be significant.

For the proposed action and alternative B changes in geomorphology due to increased surface run-off, erosion and increased sediment loads would occur in localized areas and cumulative impacts would be significant. Impacts are not likely to be significant under alternative C.

The Standard for Healthy Rangelands for water resources would continue to fail in areas due to indirect impacts and would be significant for the proposed action and alternative C. For alternative B effects are not likely to be significant.

##### 1.2.3.1 Ground Water

Under all three of the action alternatives, effects are not expected to be significant on springs, seeps and artesian wells, although some short-term reduction in flows are expected. Ground water quality is not likely to be significantly diminished under any of the alternatives. The depth to ground water in permitted wells is not expected to be significantly impacted under any of the alternatives.

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### 1.2.4 Range and Other Land Uses

Significant impacts from changes in animal unit months (AUMs), livestock mortality, and disturbance of livestock grazing operations and facilities are expected under the proposed action and alternative B. Under alternative B it is likely that range operators may suspend grazing operations due to the intensity of development in the active area. Under alternative C impacts are not expected to be significant due to reduced surface disturbance.

### 1.2.5 Vegetation

Significant effects from increased erosion from roads on moderate to steep slopes and alkali sage communities prone to erosion would result in long-term loss of productivity with significant effects for the proposed action. Alternative B is expected to have similar impacts to the proposed action. Due to reduced surface disturbance under alternative C impacts are not expected to be significant.

Indirect effects from erosion and altered run-off patterns from adjacent uplands would have significant impacts for riparian communities under the proposed action and alternative B. Effects are not expected to be significant under alternative C. Long term loss of shrubs, including Wyoming and alkali sagebrush sites, are expected to have significant impacts under the proposed action and alternative B. Reduced surface disturbance and treatment of roads would result in lower impacts to vegetation and may not be significant if overall browse use rates remain at moderate levels under alternative C.

For those aspen and mountain shrub communities that have failed Rangeland Health standards, additional disturbance from development would exacerbate the failed standard, resulting in increased difficulty in meeting the Standard, and corresponding significant effects.

The potential for the spread or new infestations of weeds on disturbed sites is high to very high, although impacts would not exceed the significance criteria for alternative B and the proposed action. Reduced surface disturbance under should result in reduced spread and infestation of weeds under Alternative C

### 1.2.6 Wildlife

For the proposed action and alternative B impacts on shrub-dependant songbird nesting habitats would be significant. Under alternative C, impacts are not expected to be significant. Impacts to greater sage-grouse and Columbian sharp-tailed grouse would be significant under all the action alternatives.

For big game, including mule deer and elk, significant effects are expected under all the action alternatives. For antelope significant effects are expected for the proposed action and alternative B. Impacts are not expected to be significant under alternative C to antelope.

Impacts to threatened and endangered, proposed and candidate species, and other sensitive species (other than greater sage-grouse and sharp-tailed grouse) and raptors are not expected to be significant under any of the action alternatives. Impacts to threatened and endangered fishes occurring downstream of the ARPA are not expected to occur. Significant impacts to BLM sensitive fishes are expected under the proposed action and alternative B in Muddy Creek. Under alternative C significant impacts are not expected.

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### 1.2.7 Recreation

Under all the action alternatives displacement of wildlife and the loss of a natural appearing setting would make the ARPA undesirable for hunting or wildlife viewing. These visitors would be displaced and impacts would be significant. Impacts to scenery, noise, dust and human activity would reduce the ARPA's desirability as a place to camp significantly under all the action alternatives. Effects to access, traffic, and from dust and human activity to the ARPA would be significant under all the action alternatives.

### 1.2.8 Visual Resources

For pleasure driving and mountain biking, impacts would be significant for the proposed action and alternative B. Impacts would not be significant under alternative C. Management objectives for VRM Class III viewsheds would be exceeded under alternative B and the proposed action. Management objectives would not be exceeded under alternative C.

### 1.2.9 Cultural Resources

Impacts to cultural resources as a result of construction activities could impact an estimated 126 sites under all the action alternatives. Reduced visual impacts to settings, where they contribute to site eligibility for historic trails, is expected to be less under alternative C compared to the proposed action and alternative B.

### 1.2.10 Socioeconomics

#### Economic Effects

Alternative C would likely result in less than 2,000 wells, depending on the specific sites proposed for development. Up to 2,000 wells could be drilled under the proposed action and alternative B. Depending on the site specific proposals that come forward drilling expenditures could be higher for individual wells under alternative C than the proposed action and alternative B based on the various development protection measures that might apply.

Direct expenditures for drilling/field development are anticipated to be \$981 million, although costs could be higher depending on development protection measures for alternative C. Economic impacts from drilling/field development are expected to be \$1.25 billion unless fewer wells are constructed under alternative C. For the proposed action and alternative B, 578 average annual jobs are predicted. Under alternative C, fewer jobs could occur depending on the site specific proposals for development received and any corresponding reductions in well numbers. \$6.4 billion in total economic impacts related to production are expected for alternative B and the proposed action. Less revenue could be realized under alternative C if fewer wells are drilled and less gas extracted. Impacts to other economic activities within the ARPA include the potential for reductions in the grazing, recreation and hunting economies from the proposed action and alternative B. Alternative C is expected to have a reduced impact on these activities.

#### Employment, Population and Housing

Peak year drilling and production employment is predicted at 1,490 for the proposed action and alternative B. Peak year population impacts are estimated at about 1,100 and peak year housing demand at 440 units for both alternatives. For alternative C, effects could be reduced if less wells are drilled due to development protection measures.

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### Local Government Facility and Service Demands

Local government facility and service demands are expected to be the same for all three action alternatives. Most local government facilities have excess capacity, while some services may need to expand to accommodate growth. Revenue should be adequate to address growth and development needs, but may lag at the time of demand. Municipalities may not receive direct project related revenues in sufficient amounts to offset the costs of needed expansion in some cases.

### Federal, State and Local Revenues

Specific amounts of revenue anticipated are detailed in Chapter 4. For all the various revenue sources the proposed action and alternative B are expected to have similar effects. Revenues under alternative C are expected to be less, depending on the effects of development protection measures on the number of wells drilled and gas extracted.

#### **1.2.11 Transportation**

Specifics of increased traffic levels are detailed in Chapter 4. Average annual daily travel levels would increase for Carbon County Road (CCR) 605N (20 Mile Road), CCR 608 (Wild Cow Road), CCR 501 (Cherry Grove Road), Interstate 80, WY 789 and WY 70 under the proposed action and alternative B. Increased traffic levels would be lower under alternative C depending upon the impacts of development protection measures on the number of wells drilled. Impacts to county roads would include additional maintenance costs, increased property tax revenues from production with the possibility of a lag time between the need for work and the realization of revenue.

#### **1.2.12 Health and Safety**

The risk of industrial injuries would occur under all three action alternatives. Due to the intensity of development and relative closeness of construction activities, there would be a slightly increased occupational hazard under alternative B. If less wells are drilling under alternative C, there would be a correspondingly reduced risk of hazards. The potential for hazardous material spills / exposure would be the same for the proposed action and alternative B, and somewhat reduced under alternative C.

#### **1.2.13 Noise**

For the proposed action and alternative C drilling, field development activities, workovers and other maintenance activities would temporarily exceed 55 dBA threshold at drilling and construction sites. Exposure would be limited to project workers who are protected by noise regulations and, temporarily, to other visitors to the Project area. For alternative B, noise impacts would be focused within the active zone with similar effects to the other action alternatives.

### **1.3 AGENCY PREFERRED ALTERNATIVE**

The BLM preferred alternative in this case is a combination of alternatives B and C. Disclosure of the agency preferred alternative does not imply that this will be the BLM's final decision. Additional information acquired during public comment periods and BLM internal review comments, may result in the selection of an alternative, or combination of alternatives



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to provide the best mix of operational requirements and mitigation / best management practices to reduce environmental harm.